1. A method of determining the position and orientation of an object or body within a bounded volume containing an AC electromagnetic field distorter, comprising the steps of:

modulating an AC magnetic field carrier frequency with a modulation waveform to generate a source signal having induction-vector components corresponding to the carrier and modulation (satellites);

stabilizing magnitude and phase of the modulated source signal with respect to the internal reference

providing a sensor to measure the induction-vector components at the location of the object or body;

analyzing the induction-vector components of the carrier and satellites to distinguish between source-sensor coupling and source-distorter-sensor coupling; and

using the source-sensor coupling to compute the position and orientation of the sensor, and hence, the object or body.

2. The method of claim 1, wherein the AC magnetic field carrier is amplitude modulated.

3. The method of claim 1, wherein the AC magnetic field carrier is frequency modulated.

4. The method of claim 1, wherein the AC magnetic field carrier is amplitude or frequency modulated with a single tone.

5. The method of claim 1, wherein the frequency of the modulation is somehow lower than the carrier.

6. The method of claim 1, wherein the steps (generation and measurements) are performed within narrow frequency bands.

7. The method of claim 1, wherein the symmetry between carrier and satellites is known.

8. The method of claim 1, further including the steps of:

positioning at least one stationary witness sensor near or within the volume of interest;

measuring the induction-vector components at the witness sensor using a known fixed position and orientation; and

using the induction-vector components from each witness sensor to more accurately compute the position and orientation.

9. The method of claim 1, wherein the signal received by the sensor is a time derivative of the source signal multiplied by a coupling constant.

10. The method of claim 1, wherein the object or body includes a person's head or other body part.

11. The method of claim 1, wherein the object or body includes a medical instrument.

12. The method of claim 1, wherein the object or body is associated with remote sensing.

13. The method of claim 1, wherein the steps are performed in real time or near real time.

14. The method of claim 1, wherein the sensor operates along two or more independent axes to detect multiple degrees of freedom.

15. The method of claim 1, wherein the sensor is a magnetic-field search coil.

16. The method of claim 15, wherein the three non-parallel sensor search coils and three non-parallel source coils for six degrees of freedom.

17. The method of claim 1, wherein the sensor is a solid-state (GMR or PSS), quantum (SQID), or flux gage magnetic flux sensor.

18. A system for determining the position and orientation of an object or body within a bounded volume containing an AC electromagnetic field distorter, comprising:

a source of a modulated AC magnetic field having induction-vector components;

an electronic circuit stabilizing magnitude and phase of the modulated source signal with respect to the internal reference;

a sensor to measure the induction-vector components at the location of the object or body; and

one or more processors to perform the following functions:

analyze the induction-vector components of the carrier and satellites to distinguish between source-sensor coupling and source-distorter-sensor coupling, and

compute the position and orientation of the sensor, and hence, the object or body based on the source-sensor coupling.

19. The system of claim 18, wherein the AC magnetic field is amplitude modulated.

20. The system of claim 18, wherein the AC magnetic field is frequency modulated.

21. The system of claim 18, wherein the AC magnetic field carrier is amplitude or frequency modulated with a single tone.

22. The system of claim 18, wherein the frequency of the modulation is somehow lower than the carrier.

23. The system of claim 18, wherein the AC magnetic field components are generated and measured within narrow frequency bands.

24. The system of claim 18, wherein the symmetry between carrier and satellite frequencies is known.

25. The system of claim 18, wherein the sensor operates along two or more independent axes to detect multiple degrees of freedom.

26. The system of claim 18, further including a stationary witness sensor positioned near or within the volume of interest to measure the induction-vector components using a known fixed position and orientation.

27. The system of claim 18, wherein the signal received by the sensor is a time derivative of the source signal multiplied by a coupling constant.

28. The system of claim 18, wherein the object or body includes a person's head or other body part.

29. The system of claim 18, wherein the object or body includes a medical instrument.

30. The system of claim 18, wherein the steps are performed in real time or near real time.

31. The system of claim 18, wherein the sensor operates along two or more independent axes to detect multiple degrees of freedom.

32. The system of claim 18, wherein the sensor is a magnetic-field search coil.

33. The system of claim 18, wherein the three non-parallel sensor search coils and three non-parallel source coils for six degrees of freedom.

34. The system of claim 18, wherein the sensor is a solid-state (GMR or PSS), quantum (SQID), or flux gage magnetic flux sensor.

35. In a tracking system of the type wherein source of an AC electromagnetic field having induction-vector components is received by a sensor on an object or body within a bounded volume to determining the position and orientation of the object or body in the presence of a field distorter, the improvement comprising:

modulating the AC electromagnetic field;

stabilizing magnitude and phase of the modulated source field components

analyzing the induction-vector components corresponding to the carrier and modulation frequencies and detected by the sensor to distinguish between source-sensor coupling and source-distorter-sensor coupling; and

computing the position and orientation of the sensor, and hence, the object or body based on the source-sensor coupling.